D. Remarks

Claims 1 to 24 remain pending in the subject case, with Claim 1 being the sole independent claim. Claim 1 has been amended to define better the present invention and to address the issues raised by the Examiner in connection with 35 U.S.C. § 112, second paragraph. Support for this amendment may be found, inter alia, in the specification at page 9, line 28, to page 10, line 20. Claims 2-12 have been amended to reflect the changes in Claim 1 and to address 35 U.S.C. § 112, first and second paragraph, issues. New Claims 13-24 have been added. Support for these new claims may be found, inter alia, at page 10, lines 8 to 37. The specification has been amended to recite more clearly domestic priority information. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claims 4 and 5 were objected to for improper use of scientific notation. These claims have now been amended to correct the scientific notation.

Claims 4, 5 and 11 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement.

Applicants have amended Claims 4 and 5 to clarify that the unit of concentration is "cells per square inch". The actual concentrations recited in Claims 4 and 5 are supported by the disclosure in the specification at page 9, lines 23 to 26.

While Applicants believe that Claim 11 originally recited a range that is fully supported by the specification at page 12, lines 12 to 18, this claim has been amended as suggested by the Examiner in order to expedite prosecution.

Claims 1 to 12 were rejected under 35 U.S.C. § 112, second paragraph, as

being allegedly indefinite. Applicants believe that the above amendments fully address the Examiner's concerns.

Claims 1 to 12 were also rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,863,882 (Lin) in view of WO 97/43385 (Horner) and U.S. Patent Nos. 3,720,606 (Horney); 4,925,707 (Vinod) and 4,839,212 (Blyth). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to review some of the key features and advantages of the presently claimed invention. That invention is directed to a surface treated so as to be capable of controlling odors produced by organic substances to which the surface is exposed. The surface may be made of any kind of material and may be of any size, shape, form and texture. The treated surface includes dormant or sporulated bacteria that is capable of becoming active when exposed to organic material and at least one adhering agent for adhering the dormant bacteria to the surface. The bacteria is adhered such that it can be exposed to the odor-causing organic material and can be activated. When the dormant bacteria is activated, it can digest the odor-causing material thereby controlling odor that otherwise would be produced. Once the odor has been eliminated, the adhered bacteria returns to its dormant state, and a subsequent application of the odor-causing organic material will once again activate the bacteria, thereby repeating the deodorizing process. The adhering agent may be a fluorochemical, a stain blocker, an acrylic polymer, a styrene butadiene rubber, a nitrile rubber and/or polyvinyl chloride.

Several types of bacteria are known for their ability to digest organic materials. However, when these bacteria are conventionally applied to a surface (e.g., carpet), the odor-controlling ability of the bacteria is not fully utilized. Specifically, according to conventional practice bacteria are merely placed onto the surface. Therefore, they are easily removed from the surface during normal usage. This leads to reduced odor control effectiveness and a shortened duration of deodorizing effects.

It is believed that a surface treated with bacteria for repeated deodorizing action has not been previously disclosed. In fact, one currently available commercial product, Bi-chem® Bioclean (copy of sales brochure attached),[1] directs users to place the bacteria on the carpet contaminated by the odor-causing material and then to vacuum up the spores after the odor has been reduced. Therefore, an additional application of bacteria is necessary before (or when) the carpet is again exposed to the odor-causing material.

The presently claimed invention solves the above-mentioned shortcomings of the prior art. Specifically, in accordance with the presently claimed invention, the dormant bacteria are adhered to the surface by at least one adhering agent. The adhering agent makes it possible to keep the bacteria in association with the surface during the normal usage of the surface (see page 9, lines 34 to 37). Furthermore, the adhering agent binds the bacteria to the surface in a manner to allow it to remain associated with the surface while also allowing the bacteria to be exposed to the odor causing material, so that the dormant bacteria may be activated (see page 9, line 37, to page 10, line 4). Due to such

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1/ Applicants do not concede that this document is prior art.

adhesion as presently claimed, the bacteria remain attached to the surface even after reverting to a dormant state when the odor-causing threat has been eliminated. Thus, the surface maintains its odor-reducing capacity, and bacteria is available to digest future deposits of the organic material (see, e.g., page 14, lines 19 to 22) without repeated bacteria application.

Specifically, when the dormant bacteria bonded to the surface is exposed to organic residue, the bacteria becomes active in the presence of moisture and produces enzymes, which start breaking down the residue. The bacteria consumes the broken-down residue as a food source and multiply to produce "offspring" bacteria. These "offspring" bacteria are identical to the adhered bacteria ("parent" bacteria) with the exception that they are not bonded to the surface.

The "parent" and "offspring" bacteria, in the presence of the moisture, continue to produce enzymes, and provided there is still an organic residue present, those enzymes continue to break down the residue. Both the "parent" and "offspring" bacteria employ the broken-down residue as a food source and both continue to multiply, generating even more free "offspring" bacteria. This process continues until either the moisture is gone (hindering the production of enzymes) or the organic residue is digested (hindering the feeding and reproduction cycle of the bacteria). At that point, all the bacteria become dormant and wait for the next exposure to moisture/organic residue.

The "waste" by-products of this enzyme generation, organic residue break-down, consumption of broken down residue as a food source and reproduction of bacteria

are carbon dioxide, water, and, eventually, dormant "free" bacteria spores. While carbon dioxide dissipates into the air, the water evaporates and the "free" bacteria spores can be removed by, for example, cleaning, the "parent"bacteria, having reverted back to their dormant state, are still bonded to the surface. Therefore, the adhered bacteria is still available for a subsequent exposure to odor-causing organic material, which allows the entire deodorizing process to be repeated without any need for re-application of the bacteria.

In addition to being able to eliminate odors upon multiple exposures to the odor-causing material over time, the presently claimed treated surface retains its odor-protective qualities even if the surface is subjected to a physical force, such as cleaning or being walked upon when the surface is a carpet, or to environmental factors, which are detrimental to bacterial cells, such as humidity, heat, UV radiation, chemical agents, and the like (page 13, line 33, to page 14, line 8; page 27, lines 9 to 16). In fact, even if the surface is disturbed before the odor-causing material has been consumed and the "offspring" bacteria is removed as a result, the adhered "parent" bacteria is able to replace the removed "offspring" bacteria through the replication process described above, so that the deodorizing can be completed. This is not possible using conventional deodorizing means, such as the Bi-chem® Bioclean product, which must be re-applied under these circumstances. The adhering agent in accordance with the present invention protects the adhered bacteria (page 11, line 35, to page 12, line 2). Furthermore, the adhering agent can protect the surface itself from damage.

The effectiveness of the adhesion according to the presently claimed invention is shown in Example 6 discussed in the specification. Specifically, as described in Example 6, after a dried plastic film with a bacterial spore blend adhered thereto by a fluorochemical was introduced into a flask and shaken for 24 hours in a bath, more than 97% of the bacteria remained associated with the surface.

The documents cited by the Examiner do not affect the patentability of the presently claimed invention. Lin is directed to formulations suitable for cleaning and sanitizing bathroom fixtures. Lin teaches that a composition containing sanitizing agents, bacterial spores and surfactants can be used for cleaning purposes. However, Lin fails to disclose or suggest that bacteria should be adhered to the surface, which is being cleaned. In fact, Applicants respectfully submit that Lin contains disclosure that teaches away from the presently claimed adhesion of bacteria to a surface. Specifically, at column 3, lines 22 to 23, Lin states that one of the optional ingredients in the cleaning composition is an abrasive. It is submitted that such an ingredient would clearly not be used if bacteria is adhered to the surface.

Horner is directed to a detergent composition comprising a combination of different α-amylases. However, while it teaches that these amylases are effective in washing soiled garments or dishes, Horner, like Lin, fails to disclose or suggest that bacteria is or should be adhered to the surface being cleaned. In fact, Applicants submit that the cleaning operations disclosed in Horner would not lead to adhesion of the bacteria to the surface as presently claimed.

Horney is directed to a formulation for controlling odor from sewage. While Horney discloses that the formulation may contain certain bacteria, it fails to disclose or suggest adhering the bacteria to the surface being cleaned. In fact, the deodorizing formulation in Horney is applied in a form of a suspension by merely being placed on the contaminated area. Under such circumstances, the bacteria would not be adhered to the deodorized surface, as presently claimed.

Both Blyth and Vinod are directed to conventional methods of protecting carpet fibers. Blyth discloses a process of applying a spin finish containing stain blockers to nylon fibers during a melt polymerization process. Vinod is directed to the application of a stain blocker to the carpet after the carpet has been manufactured. Neither Blyth nor Vinod, however, discloses or suggests that its stain-blocking compounds can or should be used as adhesives for bacteria, and that the bacteria should be adhered to a surface as presently claimed, that is, to allow the adhered bacteria to be exposed to the odor-causing material.

In sum, the prior art documents cited by the Examiner disclose bacterial compositions, fluorochemicals and stain blockers. However, these documents fail to disclose or suggest that bacteria should be adhered to the surface by at least one adhering agent as presently claimed.

The Examiner stated on page 7 of the Office Action that adding fluorochemicals and stain blockers to dormant bacteria is within the purview of an ordinary artisan. However, as a matter of law, this is not a standard for determining obviousness. A

statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See In re Kotzab, 55 U.S.P.Q.2d (BNA) 1313 (Fed. Cir. 2000). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. See Al-Site Corp. v. VSI Int'l Inc., 50 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 1999); see also M.P.E.P. § 2143.01.

The Examiner has not shown, and Applicants have not found, any disclosure in the cited art that would motivate a skilled artisan to use stain blockers and fluorochemicals disclosed in Blyth and Vinod, or any other adhering agents, to adhere bacteria to the surface for repeated deodorizing. Applicants respectfully submit that, at most, the prior art suggests that bacteria and stain blockers or fluorochemicals could be used together on a carpet. However, it is clear that such use does not inherently involve the adhesion as presently claimed. In fact, as shown by the attached sales brochure for the Bi-chem® Bioclean product, this use is a mere deposition of bacteria onto carpet fibers, which have already been treated with stain blockers and fluorochemicals, permitting the removal of bacteria by vacuuming.

In the prior art, stain blockers and fluorochemicals prevent material, including the bacteria, from adhering to the surface, which is directly opposite to what is presently claimed. Specifically, as pointed out above, the claims in the subject application state that bacteria is adhered to the surface by an adhering agent comprising, among other things, a stain blocker or fluorochemical.

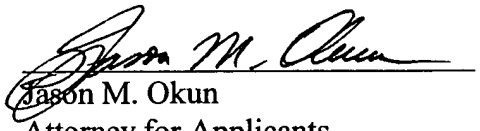
The cited documents fail to recognize the shortcomings associated with not adhering bacteria to the surface, such as requiring repeated application of bacteria to a surface upon subsequent exposure to odor-causing materials, and consequent limited duration of efficacy. Clearly, if there is no recognition of a problem, there could be no teaching or suggestion of a solution.

In conclusion, Applicants respectfully submit that the cited documents, whether considered separately or in any proper combination, do not disclose or suggest the elements presently claimed. In particular, there is no disclosure or suggestion regarding adhesion of the bacteria to a surface, which allows the bacteria to become active when exposed to the odor-causing material.

Applicants respectfully request that the outstanding objection and rejections be withdrawn and the present case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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BI-CHEM® BIOCLEAN

A Bioenzymatic Carpet and Fabric Cleaner

Effective Cleaning and Degradation of Carpet Trapped Organics

BI-CHEM BIOCLEAN is designed specifically to provide a solution for the difficult removal of organics from carpet and fabric surfaces.

BI-CHEM BIOCLEAN provides a resolution for a broad range of stain and odor problems from the smallest spot cleaning applications to full scale cleaning applications.

BI-CHEM BIOCLEAN formulation is effective in the removal of organics from carpets, upholstery, draperies, car seats, etc. **BI-CHEM BIOCLEAN** will remove both old and new odors, stains and soils resulting from combined organic and inorganic soils.

Spot Cleaning

BI-CHEM BIOCLEAN is specifically formulated as a spot area cleaner. This is a single formulation which combines selected surfactants, perfumes, and synergistic microorganisms to achieve complete organic removal in a single cleaning application.

BI-CHEM BIOCLEAN, a consortium of highly active bacterial spores, was tested for the ability to degrade organics in carpet fibers. Organic deposits in carpets result from common stains, spills and pet accidents. These organic spills lead to stains and odors. **BI-CHEM BIOCLEAN** effectively degrades these organics resulting in odor control and stain removal.

BI-CHEM BIOCLEAN was tested using industry standard carpet swatches with organic compounds commonly found in carpet spills. The carpet swatch inoculated with **BI-CHEM BIOCLEAN** in laboratory conditions demonstrated a 40 fold increase in degradation of organic material compared to untreated carpet.

BI-CHEM BIOCLEAN consists of a synergistic blend of nonpathogenic bacteria selected for their ability to degrade organic substrates. The organic spill activates the bacterial strains in **BI-CHEM BIOCLEAN.** In the presence of moisture, organic material causes the germination and growth of the microorganisms. Once the organics have been removed, the spores become dormant. The spores can then be vacuumed. **BI-CHEM BIOCLEAN** brings nature's secret indoors for a fresher, cleaner environment by eliminating residual organics that lead to malodors.

The natural solution to eliminate odors and organic stains.

BI-CHEM® BIOCLEAN

A Bioenzymatic Carpet and Fabric Cleaner

PERFORMANCE BENEFITS

- **General Organic Waste Degrader**
- **Enhanced Aerobic and Anaerobic Performance,** ideal for applications subject to aerobic and anaerobic environments.
- **Accelerated Enzymatic Degradation,** allows the multiple spore blend to work faster and more effectively.
- **Grease Biodegradation Outperforms** other competitive formulations in laboratory and field studies.
- **Superior Germination and Outgrowth** results in increased bacterial activity in a variety of organic waste applications.

CHARACTERISTICS, HANDLING, & STORAGE

Product Characteristics:

Bacteria Count:	5.4 x 10^7 C.F.U./ml (200 Billion/gallon)
Bacteria Type:	Blend of Bacillus Spores
Salmonella/Shigella:	Negative
Appearance:	Creamy White
Fragrance:	Pleasantly Perfumed
Stability	2 years + at 35°F to 95°F

Performance Characteristics:

High Enzyme Production:	Lipase/Protease/Amylase/ Cellulase/Urease
Bacterial Pathways:	Aerobic and Facultative Anaerobic
Optimum pH range:	6.8 - 7.0

Directions:

1. Test for colorfastness on section which does not show.
2. Remove excess solids or liquids.
3. Spray, mop or wipe a generous supply of **BI-CHEM BIOCLEAN** on to the surface to be cleaned. Following this application, use **BI-CHEM BIOCLEAN** as though it were a mild detergent to assist in the removal of the contaminants in the fabric or carpet surface.
4. Scrub any stains with **BI-CHEM BIOCLEAN.**
5. Rinse the area with fresh, warm water utilizing a sponge or soft towel in efforts to remove any residual organics.
6. In extreme cases, areas subjected to repeated soiling may require additional wetting of the surface to extend the bioenzymatic cleaning time. Place a clean wet towel over the stain for 24 hours. **BI-CHEM BIOCLEAN** provides instant odor control and contact surface cleaning, combined with bioenzymatic digestion of trapped residual organics.

Storage and Handling:

Store in cool, dry place.

Avoid inhalation,wash hands after contact and avoid eye contact.

Available Packaging:

- 1 gallon jugs
- 5 gallon pails
- 55 gallon drums

6/97-LMLD

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Ordering Information

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Birmingham, NJ 08011

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(800 -284-7435)
Phone: (800) 678-0020 or (609) 893-1100
Fax: (609) 894-8641
Internet: www.sybronchemicals.com

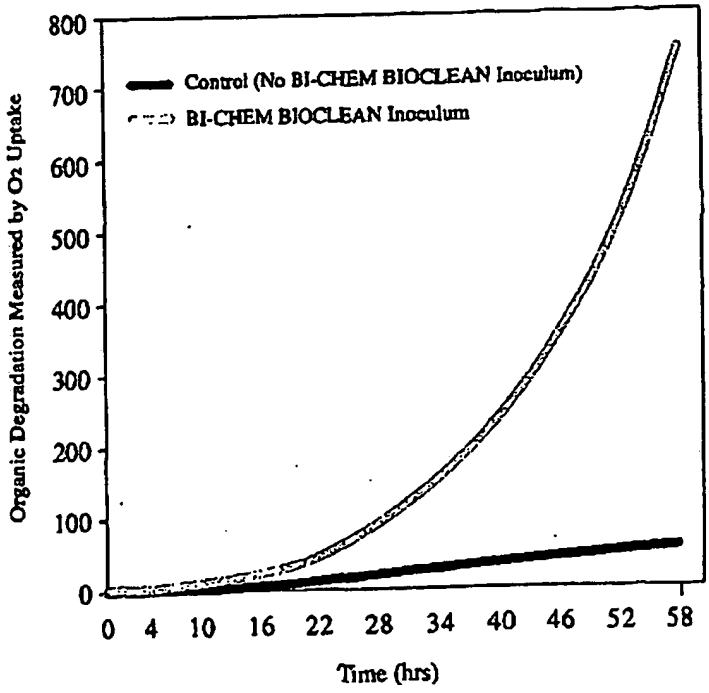
BI-CHEM® BIOCLEAN

Effective Cleaning and Degradation of Carpet Trapped Organics

BI-CHEM BIOCLEAN, a proprietary formulation of surfactant based cleaners with a consortium of highly active bacterial spores, effectively degrades residual organics on carpet fibers. Organic deposits in carpets result from common stains, spills, and pet accidents. These deposits lead to stains and odors. **BI-CHEM BIOCLEAN** effectively degrades organics resulting in odor control and stain removal.

BI-CHEM BIOCLEAN was tested using industry standard carpet swatches with organic compounds commonly found in carpet spills. The carpet swatch innoculated with **BI-CHEM BIOCLEAN** in laboratory conditions demonstrated a 40 fold increase in degradation of organic material compared to untreated carpet. The graph below indicates germination and growth of spores on a carpet with spilled organics.

BI-CHEM BIOCLEAN Outgrowth on Carpet



BI-CHEM® BIOCLEAN

Effective Cleaning and Degradation of Carpet Trapped Organics

The following electron microscopy photographs demonstrate the innoculation of bacteria on carpet fibers, which degrade residual organic spills in carpet fibers, by **BI-CHEM BIOCLEAN** selectively adapted bacteria.

BI-CHEM BIOCLEAN consists of a synergistic blend of non-pathogenic bacteria selected for their ability to degrade organic substrates. The organic spill activates the bacterial strains in **BI-CHEM BIOCLEAN.** In the presence of moisture, organic material causes the germination and growth of the microorganisms. Once the organics have been removed, the spores become dormant. The spores will then be vacuumed and removed during normal carpet maintenance.

BI-CHEM BIOCLEAN brings nature's secret indoors for a fresher, cleaner environment by eliminating residual organics that lead to malodors.

The natural solution to eliminate odors and organic stains.

6/97-LMLD

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